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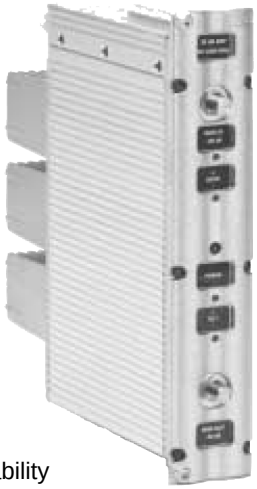
## RF Worx® SignalOn™ Series



Leveraging over a decade of RF amplifier design experience, ADC's new SignalOn Series amplifier has been engineered to meet these demanding service requirements. Featuring operation from 50 MHz to 1 GHz, the amplifier offers excellent performance and reliability. SignalOn Series amplifiers and associated power supplies can be housed in the same chassis as the SignalOn Series passive products for increased design flexibility. And with its electronically variable gain and slope controls, you can adjust signal levels in your network with no service downtime.

Leveraging over a decade of RF Worx amplifier design experience, ADC's new SignalOn Series amplifier features 50 MHz to 1 GHz operation with excellent performance. The non-serviceaffecting gain and slope controls, along with the patented make-before-break attenuator pad design of the splitters and combiners, allow for "hitless" RF signal adjustment - critical for today's carrier-class broadband service applications.

- Operation from 50 MHz to 1 GHz
- GaAs technology with near-100% surface mount design for high performance and reliability
- Mounts in same SignalOn chassis as passive modules for maximum design flexibility
- Digitally variable gain and slope control for non-service-affecting signal level adjustments
- Convenient front panel controls
- 20 dB monitor points on both input and output signals for testing and troubleshooting
- "Blind-mate" power bus connector with gold-on-gold contacts; requires no cabling
- Chassis-mounted AC-DC and DC-DC power supply options
- Redundant powering with dual load shared power supplies for increased availability
- External +24VDC powering option

**Ordering Information**

**Amplifiers** N – MA **1** **22** **33**

**1** – **F** (F)
**B** (BNC)

**22** – **30** (30 dB)
**XX** (xx dB – *future*)

**33** – **FA** (Forward Amp)
**RA** (Reverse Amp – f*uture*)

**Power Supplies** N – MA **1111**

**1111** – **UVAC** (Universal AC -*100/110/240*)
**48DC** (-48V DC)

**Chassis** N – C **111** **2** **3**

**1** – **20V** (20 position, Vertical)

**2** – **N** (No)
**Y** (Yes)

**3** – **B** (Black)
**C** (Blue)
**P** (Putty White)

**Power Upgrade Kit**
- Kit to convert passive SignalOn chassis to powered ..... N-ACC-PWRKIT-20X

**Cable Management Kits** *(includes rack mount cable management rings)*
- 2 brackets, 2 - 2.5" x 5.5" cable rings ..... N-ACMK-01P
- 4 brackets, 12 - 2.5" x 5.5" cable rings ..... N-ACMK-04P

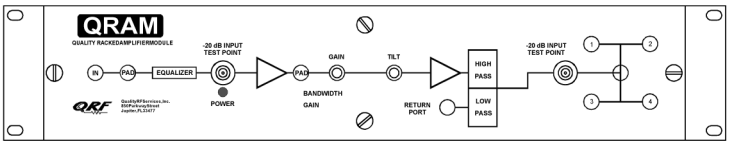
**Chassis Extender Brackets**
- 20-position chassis, 23" rack ..... EB-87P
- 20-position chassis, ETSI 21" rack ..... EB100

**Insertion/Withdrawal Tool**
- BNC connector ..... BT2000
- F connector ..... SC-F or SC-FG

**Terminating Plugs**
- BNC High Performance Terminating Plug, 75 Ohm ± 0.1% ..... BNC-TP2
- F High Performance Terminating Plug, 75 Ohm ± 0.1% ..... CF-TP2

**Miscellaneous**
- Power Supply Fan Unit (Field Replaceable) ..... N-ACC-FAN
- Kit to install two RF Worx reverse amps into powered SignalOn chassis ..... N-ACC-BRKT-RA

## Quality Rack Amplifier Module




- QRAM 550 & 750/870 MHz Amplifiers
  - o Plug-in output diplex filter
- QRAM 200 MHz Headend Amplifier
- Variable gain & tilt controls
- Plug-in Splitters & Dir. Coupler T.P.
- U.L. Transformer & DC Powering

**Ordering Information**

QRAM 750 - 30 CGP
**1 2 3 4**

**1**: Amplifier Model
**2**: Bandwidth
870 = 870 MHz
750 = 750 MHz
550 = 550 MHz
200 = 200 MHz
**3**: Gain (See below)
**4**: Output technology
Blank = Push-pull
P = Power Double
Q = Quadra Power
F = Feedforward
CGP= Cascaded Gallium Arsenide (GaAs) PD

Options:

- QRAM870-2S ..... Two way splitter, 870 MHz
- QRAM870-4S ..... Four way splitter, 870 MHz
- QRAM870-20TP ..... -20 test point, rear output port #3 (Only ONE of the above options may be used.)
- QRAM870-40/54-DF ..... Diplex filter, 5 MHz to 40 MHz.
- QRAM870-62/85-DF ..... Diplex filter, 5 MHz to 62 MHz.
- QRAM-RFI-OPTION ..... Front cover RFI gasket
- QLX750-xx ..... 750 or 860 MHz equalizers, 0 dB through 24 dB, 2 dB steps. (Used in QRAM750)
- QEE(freq), dB ..... 450 MHz — 6, 12, 18, 24 dB 550 MHz, 3 dB Steps, 0 to 24 dB (Used in QRAM750)
- SXP-TY-**. ..... Plug-in pad, 0 - 20 dB, 1 dB steps
- SXP-** ..... Pad used in 750 MHz splitters.
- #951 ..... 120 volts to 26 volts, 60 Hz AC power transformer, 50 VA rating (Order for spares)

| | QRAM200 | QRAM550 | | | QRAM750 | | | QRAM870 | |
|---|---|---|---|---|---|---|---|---|---|
| Technology | Push-Pull | Pwe Dbl | Quadra | Feedfwd | Pwr Dbl | Quadra | GaAs | Qudra | GaAs |
| Gains Available (dB) | 21, 31, 35, 38 | 27, 31, 35 | 27, 31, 35 | (18,22), 33 | 29, 33 | (17), 27, 31 | 30, 33 | 23, 27, 31 | 30, 33 |

## Headend Amplifier

The DC-300 series consists of **three headend amplifiers and two power supplies** housed in a single one rack unit high chassis. There are several models of amplifiers for both forward and reverse applications. Each chassis has two power supplies in hot standby mode. If one supply should fail, the load will be transferred automatically to the secondary unit without service disruption.

As with all our amplifiers, the DC-300 is designed to be service friendly by incorporating hot, swappable, and easy to remove modules. In addition, plug in pads and equalizers can be utilized for balancing individual lasers. Remote status monitoring is available through a DB-15 connector on the rear of the chassis. Each chassis houses three amplifiers and two power supplies.

- *Hot standby redundant power supply*
- *Compact - only one rack unit high*
- *Remote monitoring*
- *Failure alarm monitoring of amplifiers and power supplies through LED on front panel*
- *Service friendly through hot swappable modules*
- *Flat frequency response ±0.5 dB*
- *High performance RF specifications*
- *System balancing using plug-in pads and equalizers*

| Model | FDA-19-870 | FDA-24-870 | FDA-27-870 | RDA-27-65 |
|---|---|---|---|---|
| Bandwidth, MHz | 54-870 | 54-870 | 54-870 | 5-65 |
| Gain, dB(min) @870 MHz | 19.5 | 24 | 27 | 27 |
| Input-Output Ports | F female | F female | F female | F female |
| Dim (inches) | 1.75 x 19W x 17.25D | | | |
| Weight | 10 lb | | | |
| AC Input Power | 110/ VAC / 60 Hz, 16 W | | | |
| Optional Power Input | -48 VDC | | | |

ELECTROLINE

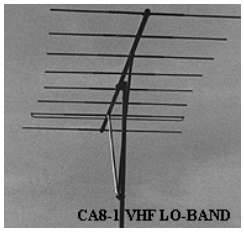
## CA Series Mount VHF Array

The SITCO CATV Series antenna arrays are designed for the cable system “head-end” sites. This series fills the need for high gain deep fringe antenna arrays.

The SITCO CA-Series arrays are specifically tuned and cut to the individual channel (one channel only). With high gain and sharp forward pattern, these arrays will insure excellent picture quality, due to the reduction in multipath signal “pick-up”.

The antennas shown below are equipped with a balun transformer and a 75 ohm “F” connector termination. Standard models include clamps for masts as large as 1-1/2" OD. Clamps for larger masts should be specified.

| **CA8-1** | |
|---|---|
| *Channels 2 through 6 & FM* | |
| Forward gain | 14.0 db |
| Front-to-back ratio | 22 db |
| Front-to-side ratio | 17 db |
| Horizontal angle | 32° |
| **CA12-1** | |
| *Channels 7 through 13* | |
| Forward gain | 15.0 db |
| Front-to-back ratio | 28 db |
| Front-to-side ratio | 17.5 db |
| Horizontal angle | 27° |



**Ordering Information**

- CA8-1-X ..... Channels 2 through 6 & FM
- CA12-1-X ..... Channels 7 through 13

  X = *Specify channel #*

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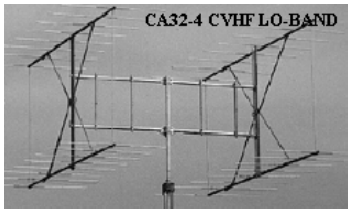
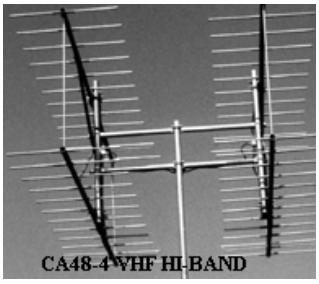
## CA Series Mount VHF Quad Array

The SITCO CATV Series multi-bay quad mounted antenna arrays are the ultimate in high performance and durability for the CATV system “head-ends”.

These arrays are designed for high gain, high front to back ratio, extremely sharp forward “pick-up” lobe and large aperture to weak signals.

| **CA32-4 CVHF LO-BAND** | |
|---|---|
| *Channels 2 through 6 & FM* | |
| Forward gain | 20.0 db |
| Front-to-back ratio | 39 db |
| Front-to side ratio | 21.7 db |
| Horizontal angle | 22° |
| **CA48-4 VHF HI-BAND** | |
| *Channels 7 through 13* | |
| Forward gain | 20.0 db |
| Front-to-back ratio | 41 db |
| Front-to-side ratio | 19 db |
| Horizontal angle | 20° |




**Ordering Information**

- CA32-4-X ..... Channels 2 through 6 & FM
- CA48-4-X ..... Channels 7 through 13

  X = *Specify channel #*

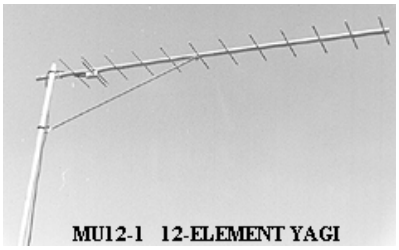
## MU Series End Mount UHF Array

The SITCO MU- Series solid bar antenna arrays have been developed as a new line of antennas for UHF TV series. The MU antennas may be obtained as single bays, stacks or quad mounted models.

The new SITCO MU-Series antennas are tuned to cover any desired UHF TV Channel. Wide element spacing is used to produce a sharp directivity “pick-up” pattern, which in turn produces clean, ghost-free picture quality.

The MU-Series antenna arrays use HEAVY DUTY construction throughout to insure long lasting duty at sites where weather conditions require mechanical durability.

| **Model MU12-1 12element YAGI** | |
|---|---|
| *Channels 14 through 83* | |
| Forward gain, single | 14.5 db |
| Stacked | 17.0 db |
| Front-to-back ratio | 24.5 db |
| Front-to-side ratio | 16.5 db |
| Horizontal angle | 28° |


MU12-1 12-ELEMENT YAGI

**Ordering Information**

- MU12-1X ..... Channels 14 through 83
  X = *Specify channel #*

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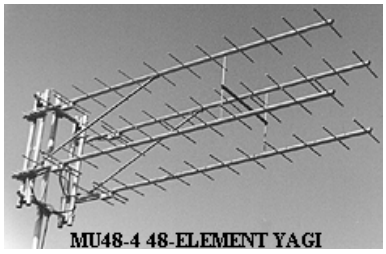
## MU Series UHF Quad Array

The SITCO MU- Series UHF Quad Arrays are manufactured an designed for the systems that require high gain, high signal-to-noise ratio, high front-to-back ratio and sharp forward signal “pick-up”. These arrays are ideally suited for the installations that not only require excellent signal “pick-up” but also reliable durable construction for a long lasting installation.

| **Model MU48-4 48-elements** | |
|---|---|
| *Channels 14 through 83* | |
| Forward gain | 20.0 db |
| Front-to-back ratio | 27 db |
| Front-to-side ratio | 18 db |
| Horizontal angle | 20° |


MU48-4 48-ELEMENT YAGI

**Ordering Information**

- MU48-1-X ..... Channels 14 through 83
  X = *Specify channel #*

## Log Periodic Array Broadband Antennas

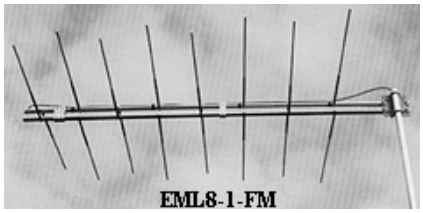
The SITCO EML and ECL-Series log periodic dipole arrays are designed for medium gain, broadbanded receiving applications. The ECL-Series is designed for applications requiring the extra gain.

These arrays are durably constructed of high grade aluminum alloys with the mechanical strength required to withstand the extremely adverse weather encountered at many sites. All elements are sleeved solid rods with rounded ends.

SITCO EML and ECL-Series have been carefully designed to provide maximum gain flatness over any given channel within the antenna's passband, crucial to receiving accurate color information.

The SITCO ECL and EML-Series antennas are constructed of 6061-T6 aluminum alloy. All booms are of tubing with a wall thickness of .058" for strength and durability. All elements are solid 3/8" rod with a 1/2" x .058" sleeve for added strength, and to reduce metal fatigue induced by vibration in high winds. All elements have rounded ends to allow a continuous, low-level static discharge, greatly reducing noise caused by static buildup and subsequent sporadic high level discharge.

| | SERIES | LO-BAND | HI-BAND | FM | UHF |
|---|---|---|---|---|---|
| **GAIN** | ECL Series<br>EML Series | 11 db<br>9 db | 12 db<br>10 db | 12 db<br>10 db | 12 db<br>n/a |
| **HORIZONTAL HALF-POWER BEAMWIDTH** | ECL Series<br>EML Series | 68°<br>69° | 56°<br>56° | 56°<br>56° | 56°<br>n/a |
| **FRONT/BACK RATIO** | ECL Series<br>EML Series | 31 db<br>30 db | 21 db<br>21 db | 31 db<br>30 db | 27 db<br>n/a |
| **FREQUENCY RESPONSE** | Less then 1/2 db deviation on gain over any given | | | | |
| **POWER RATING** | 100 watts | | | | |
| **TERMINATION** | 75 ohm, female "F" type fitting standard. Other | | | | |


EML8-1-FM

**Ordering Information**

- EML8-1-2/6
- EML8-1-7/13
- EML8-1-FM
- ECL12-1-2/6
- ECL12-1-7/13
- ECL12-1-FM
- ECL16-1-14/69

## 3.8 m Prime Focus Antenna System

The Patriot 3.8 meter antenna is manufactured in the United States and is the symbol of quality in the antenna industry. It features a variety of mounts and a solid aluminum reflector which is powder coated for superior protection against the elements. Stainless steel hardware is also available. This antenna is excellent for Broadcast, Educational, SMATV, CATV, and Headend Applications.

The 3.8 meter prime focus reflector consists of 16 draw die formed petals and achieves a .020" surface accuracy. The contoured petals with matched radial beams and hub assembly ensure easy installation without field alignment. This antenna is competitively priced for the broadcast and cable industry and complete turnkey systems are available.

- Specifically Designed for FCC Spec. 29-25 Log q for 2° Spacing
- Multi-Feed Systems Available (up to 4)
- Available in Dual Axis Motorized, Fixed Az-El Head, Polar, and Dual Axis Navigator Mounts
- 125 MPH Wind Survival
- High Accuracy Antenna, Low Transportation Cost
- 16 segment reflector

**Ordering Information**

- PRT – 380 ..... 3.8 Meter Prime Focus Receive-Only Antenna

  *Other models available*
  - PRT – 180 ..... 1.8 Meter Prime Focus Receive-Only Antenna
  - PRT – 200 ..... 2.0 Meter Prime Focus Receive-Only Antenna
  - PRT – 240 ..... 2.4 Meter Prime Focus Receive-Only Antenna
  - PRT – 280 ..... 2.8 Meter Prime Focus Receive-Only Antenna
  - PRT – 310 ..... 3.1 Meter Prime Focus Receive-Only Antenna
  - PRT – 450 ..... 4.5 Meter Prime Focus Receive-Only Antenna
  - PRT – 500 ..... 5.0 Meter Prime Focus Receive-Only Antenna
  - PRT – 610 ..... 6.1 Meter Prime Focus Receive-Only Antenna

## Patriot Meter Ku-Band Cost Efficient Offset Antenna System

**Patriot Antennas have superior surface accuracy**. The 1.2, 1.5, and 1.8 meter reflectors are precision single piece reflectors produced in high volume utilizing precision draw dies. Patriot reflectors are randomly checked for R.M.S. accuracy with dial indicator check fixtures. All mounting holes are die pierced for uniform accuracy. The feed boom assembly is matched for either DBS or linear LNBF applications. The dish structures have been wind tunnel tested by Aeronautical Research Laboratories (ARL).

**Patriot Antennas have superior corrosion resistance.** All reflector and mount parts are produced from dual sided galvanized steel. Reflector and mount parts are sealed and powder coated with U.V. inhibited polyester-based finishes that are baked onto the metal. Mounting hardware is treated with DACROTIZED and salt spray tested.

**Patriot Antennas are designed to weather the storm.** All of the antenna mounts are designed to withstand wind forces in excess of 100 mph. Patriot metal antennas will uniformly expand and contract with temperature changes.

- DBS or Feed Applications
- Single Piece Reflector
- Reinforced Outer Rim
- Galvanized Reflector with Poly-Powder Coat Finish
- Dacrotized Hardware

**Ordering Information**

- PTX-120 ..... 1.2 Meter Ku/Band Offset Antenna System
- PTX-150 ..... 1.5 Meter Ku/Band Offset Antenna System
- PTX-180 ..... 1.8 Meter Ku/Band Offset Antenna System

  *Other Models Available*
  - PTX-110 ..... 1.1 Meter Ku/Band Offset Antenna System
  - PTX-76 ..... .76 Meter Ku/Band Offset Antenna System
  - PTX-60 ..... .60 Meter Ku/Band Offset Antenna System

PATRIOT Antenna Systems

## Ominstar® GX2

Optical Broadband Transmission Platform

The OmniStar GX2 provides increased module density, while continuing the OmniStar legacy of scalability, performance and flexibility. The four rack-unit chassis accepts up to 16 plug-n-play application modules minimizing headend space requirements. With superior 1310nm and 1550nm products, the OmniStar GX2 enables operators to offer more revenue-generating services.

The universal platform and full complement of application modules can accommodate any system architecture. Enhanced with PowerPC® technology provided by Motorola, this next generation broadband platform brings newfound intelligence to traditional headend equipment. The high-performance chip which is used in today's luxury automobiles to enable in-car networking, is the foundation of this denser, smarter, and more efficient design.

- High Module Density: Up to 16 application modules in a four rack-unit chassis provides 2.5 times the density of the previous OmniStar platform
- Intelligence: Contains high-performance PowerPC® microcontroller provided by Motorola
- Flexibility: The universal chassis and full-complement of application modules accommodates any system architecture
- Quick-Swap Capability: Replacement modules are recognized and updated with settings pre-stored by the Control Module
- User-Friendly browser-style local interface and downloadable firmware
- Redundant AC and/or DC powering options, even with 16 application modules
- Open Interface: Network Management interface supporting SNMP via Ethernet port
- Plug-n-Play application modules with blind-mate RF connectors in the rear
- Energy Efficient: Designed with advanced integrated circuits for low power consumption
- Local Status Monitoring and Control with optional shelf door and alphanumeric display

**Ordering Information**

- *Individual Components*

| Mode Number | Description |
|---|---|
| GX2-HSG000N | Housing |
| GX2-CM100B | Control module |
| GX2-PSAC10C | AC power supply |
| GX2-PSDC10C | DC power supply |
| GX2-SDU100B | Shelf door with display unit* |
| GX2-SDU200B | Shelf door without display unit |

**Display unit requires the control module in order to function*

- *Configured Chassis*

A configured chassis provides a convenient way to order and receive the OmniStar GX2 platform essentials. Various combinations of the housing, control module, shelf door and power supplies can be ordered in a configured chassis using a single model number. Configured chassis elements are shipped in a master box.

| Model Number | Powering | Control Module | Shelf Door with Display Unit |
|---|---|---|---|
| GX2-HSG112A | 2 AC Supplies | Yes | Yes |
| GX2-HSG112D | 2 DC Supplies | Yes | Yes |
| GX2-HSG111A | 1 AC Supplies | Yes | Yes |
| GX2-HSG111D | 1 DC Supplies | Yes | Yes |
| GX2-HSG012A | 2 AC Supplies | Yes | No |
| GX2-HSG012D | 2 DC Supplies | Yes | No |
| GX2-HSG011A | 1 AC Supplies | Yes | No |
| GX2-HSG011D | 1 DC Supplies | Yes | No |

MOTOROLA

## Ominstar® GX2 GX2-LM1000B Series

Broadcast Transmitter 1310 nm

The OmniStar GX2-LM1000B Broadcast Transmitter utilizes a high-power DFB laser, an integrated low-noise preamp, state-of-the-art predistortion and anticlipping circuitry. The compact, energy-efficient design allows up to 16 plug-n-play transmitter modules to operate in the four rack-unit OmniStar GX2 housing, minimizing valuable headend space requirements. As the first gigahertz 1310 nm broadcast transmitter in the industry, it enables operators to offer more revenue-generating services. Enhanced with PowerPC technology by Motorola, the LM1000B series of transmitters introduces a new found intelligence to traditional headend equipment. The hotswappable modules with unique embedded features like Quick-Swap Module Configuration maximize in-service time by eliminating the need for manual configuration. The wide range of optical output power, coupled with the full complement of other OmniStar GX2 application modules, provides extreme flexibility for network design and fiber link optimization.

- High Module Density
  - Up to 16 transmitter modules in a four rack-unit housing
- High Performance
  - Advanced predistortion circuitry achieves superior CSO and CTB performance
  - Integrated low-noise preamp allows a low RF input level
  - Unique anticlipping circuitry yields excellent BER performance for digital data
- Intelligence
  - Contains high-performance PowerPC microprocessor provided by Motorola
- Quick-Swap Capability
  - Replacement modules are recognized and updated with settings prestored by the control module.
- Flexibility
  - Full range of output powers from 2 dBm to 14 dBm, separate broadcast and narrowcast RF inputs and multiple gain modes accommodate various system architectures
- User Friendly
  - Two RF test points (input & laser drive) and CW/Video modes provide accurate link optimization
- Energy Efficient
  - Designed with advanced integrated circuits for low power consumption
- Plug-n-Play
  - Application modules with blind-mate RF connectors in the rear

**Ordering Information**

| MODEL | OUTPUT Power (Min. dBm) | FIBER Length (km) | PASSIVE Loss (dB) | Total Optical Loss (dB) (Fiber + Passive loss) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| GX2-LM1000B2 | 2 | 2.5 | 1.1 | **54** | 53 | 52 | | | | | | | | | | | | |
| GX2-LM1000B3 | 3 | 5 | 1.3 | 55 | **54** | 53 | | | | | | | | | | | | |
| GX2-LM1000B4 | 4 | 7.5 | 1.4 | | 55 | **54** | 53 | 52 | | | | | | | | | | |
| GX2-LM1000B5 | 5 | 10 | 1.5 | | | 55 | **54** | 53 | 52 | | | | | | | | | |
| GX2-LM1000B6 | 6 | 12.5 | 1.6 | | | | 55 | **54** | 53 | 52 | | | | | | | | |
| GX2-LM1000B7 | 7 | 15 | 1.7 | | | | | 55 | **54** | 53 | 52 | | | | | | | |
| GX2-LM1000B8 | 8 | 17.5 | 1.9 | | | | | | 54.5 | **53.5** | 52.5 | 51.5 | | | | | | |
| GX2-LM1000B9 | 9 | 20 | 2 | | | | | | | 54.5 | **53.5** | 52.5 | 51.5 | | | | | |
| GX2-LM1000B10 | 10 | 22.5 | 2.1 | | | | | | | | 54.5 | **53.5** | 52.5 | 51.5 | | | | |
| GX2-LM1000B11 | 11 | 25 | 2.2 | | | | | | | | | 54 | **53** | 52 | 51 | | | |
| GX2-LM1000B12 | 12 | 27.5 | 2.4 | | | | | | | | | | 54 | **53** | 52 | 51 | | |
| GX2-LM1000B13 | 13 | 30 | 2.5 | | | | | | | | | | | 54 | **53** | 52 | 51 | |
| GX2-LM1000B14 | 14 | 32.5 | 2.6 | | | | | | | | | | | | 54 | **53** | 52 | 51 |

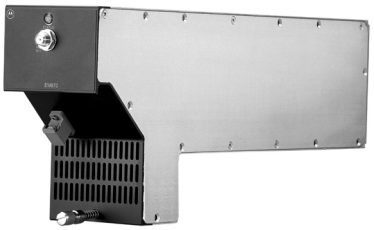
*Notes:*
*• All performances specified for a channel loading of 79 NTSC channels @ +15 dBmV/ch + 320 MHz digital at -6 dBc.*
*• Specifications measured using a GX2-RX1000B receiver.*
*• Specifications are measured using CW carriers per SCTE standards.*

MOTOROLA

## OMNISTAR GX2 GX2-EM870 Series

1550 nm Broadcast Transmitter

The OmniStar GX2-EM870 series of 1550 nm Broadcast Transmitters uses advanced optical linearization technology to provide low noise and superior distortion performance.



The suite of products satisfies various applications: full band loading or split band loading, super trunking or distribution to nodes, long-distance transport or short hops. Also, the transmitters are optimized to specific channel plans for 4 MHz or 5 MHz transmission system standards. A patented amplitude modulation technique provides Stimulated Brillouin Scattering (SBS) suppression up to 16 dBm enable long links when used in conjunction with optical amplifiers.

The transmitter uses a 1550 nm DFB laser diode as a precision light source, which is modulated by an optically linearized Mach Zehnder modulator. Use of external modulation technology eliminates laser chirp and allows designs of transport systems for distances well beyond 100 km.

Enhanced with PowerPC technology by Motorola, the GX2-EM870 series introduces a new found intelligence to traditional headend equipment. The system performance is continuously monitored and a sophisticated control algorithm assures optimum performance.

- Provides full performance 50 - 870 MHz forward bandwidth
- Designed for combination analog/digital operation
- SBS suppression up to +16 dBm
- Test point for RF input
- PowerPC provides advanced control to assure optimum performance

**Ordering Information**

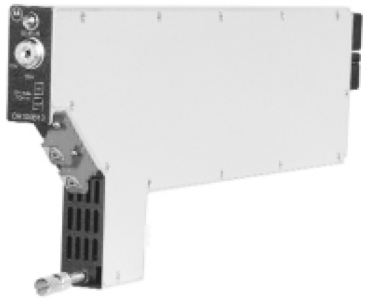
| Model Number | Description |
|---|---|
| GX2-EM870B7/16 | 1550 nm Broadcast Tx, 79 NTSC channels, 7 dBm Tx, SBS suppression 16 dBm minimum |
| GX2-EM870B7/13 | 1550 nm Broadcast Tx, 79 NTSC channels, 7 dBm Tx, SBS suppression 13 dBm minimum |
| GX2-EM870B10/11 | 1550 nm Broadcast Tx, 79 NTSC channels, 10 dBm Tx, SBS suppression 11 dBm minimum |
| GX2-EM325B7/16 | 1550 nm Broadcast Tx, 40 NTSC channels low, 7 dBm Tx, SBS suppression 16 dBm minimum |
| GX2-EM550B7/16 | 1550 nm Broadcast Tx, 39 NTSC channels high, 7 dBm Tx, SBS suppression 16 dBm minimum |
| GX2-EM870D7/16 | 1550 nm Broadcast Tx, 64 PAL channels, 7 dBm Tx, SBS suppression 16 dBm minimum |
| GX2-EM870D7/13 | 1550 nm Broadcast Tx, 64 PAL channels, 7 dBm Tx, SBS suppression 13 dBm minimum |
| GX2-EM870D10/11 | 1550 nm Broadcast Tx, 64 PAL channels, 10 dBm Tx, SBS suppression 11 dBm minimum |
| GX2-EM325D7/16 | 1550 nm Broadcast Tx, 32 PAL channels low, 7 dBm Tx, SBS suppression 16 dBm minimum |
| GX2-EM550D7/16 | 1550 nm Broadcast Tx, 32 PAL channels high, 7 dBm Tx, SBS suppression 16 dBm minimum |

MOTOROLA

## OMNISTAR® GX2 GX2-OA100B SERIES

Optical Amplifier

Network applications of the Motorola OmniStar GX2- OA100B Series Optical Amplifiers include in-line optical amplifiers for long-haul trunks and DWDM architectures, as well as applications for direct distribution to multiple nodes. The GX2-OA100B Series Optical Amplifiers are designed for use with the OmniStar® GX2 1550 nm directly or externally modulated transmitters. With adjustable output and three nominal powers available, +13dBm, +16dBm and +18dBm, the GX2-OA100B Series will accommodate link budgets for most trunk applications. Its three operating modes can satisfy a wide range of system design requirements: Constant Output Power mode-to maintain exact optical levels; Constant Pump Power mode-to optimize noise figures; and Constant Gain mode for DWDM applications. The GX2- OA100B Series Optical Amplifiers employ a proprietary Erbium-doped fiber formulation that provides low noise performance and the most reliable 980 nm pump lasers available in the industry. Other user benefits offered as part of the OmniStar GX2 platform include: higher density, SNMP interface for network management, embedded birth certificates and Quick-Swap module capability.



**BENEFITS INCLUDE:**

- Low Noise Figure
- User-settable optical power alarms
- Flat gain for DWDM applications from 1546nm to 1562nm
- Constant Output Power, Constant Gain, and Constant Pump Power Modes
- Front Panel Key Switch provided for pump on/off control
- Quick-Swap capability allows replacement modules to be automatically configured to prestored settings
- Includes a PowerPC® microprocessor made by Motorola for intelligent communication with the GX2-CM100B Control Module
- Operating Temperature Range from -20°C to +65°C

**Ordering Information**

| Model Number | Description |
|---|---|
| GX2-OA100B13 | 1550 nm Erbuim Doped Fiber Amplifier, 13dBm Output, SC/APC Optical Connector |
| GX2-OA100B13/E | 1550 nm Erbuim Doped Fiber Amplifier, 13dBm Output, E2000 Optical Connector |
| GX2-OA100B16 | 1550 nm Erbuim Doped Fiber Amplifier, 16dBm Output, SC/APC Optical Connector |
| GX2-OA100B16/E | 1550 nm Erbuim Doped Fiber Amplifier, 16dBm Output, E2000 Optical Connector |
| GX2-OA100B18 | 1550 nm Erbuim Doped Fiber Amplifier, 18dBm Output, SC/APC Optical Connector |
| GX2-OA100B18/E | 1550 nm Erbuim Doped Fiber Amplifier, 18dBm Output, E2000 Optical Connector |

## OMNISTAR® GX2 GX2-RX200BX2

Dual Return Path Receiver

With two independent receivers in the module, the OmniStar GX2-RX200BX2 return path receiver module provides a high-density solution for advanced upstream video and data traffic. The wide optical input power range can accommodate today's evolving networks with varying link budgets. An integrated low-noise pre-amplifier and high-performance post-amplifier offers high RF output level and exceptional distortion performance. Enhanced with PowerPC technology by Motorola, these receivers introduce a new found intelligence to traditional headend equipment. The hot-swappable modules with unique embedded features, like Quick-Swap Module Configuration, maximize in-service time by eliminating the need for manual configuration. This receiver, coupled with the full complement of other OmniStar GX2 application modules, provides extreme flexibility for network design and fiber link optimization.

- High Module Density–Up to 16 dual receiver modules in a four rack-unit housing
- High Performance–An integrated low-noise preamp and high-performance post amp allows a high RF output level and exceptional distortion performance
- Intelligence–Contains high-performance PowerPC microprocessor provided by Motorola
- Quick-Swap Capability–Replacement modules are recognized and updated with settings pre-stored by the Control Module
- Flexibility–A wide optical input range from 0 to -16 dBm accommodates various system architectures
- User Friendly–Two independent front panel RF test points (one for each receiver) and two gain modes simplify link optimization–Plug-n-Play application modules with blind-mate RF connectors in the rear
- Energy Efficient–Designed with advanced integrated circuits for low power consumption

**Ordering Information**

| Model Number | Description |
|---|---|
| GX2-RX200BX2 | Dual return path receiver module, SCAPC optical connector |
| GX2-RX200BX2/E | Dual return path receiver module, E2000 optical connector |

MOTOROLA

## OMNISTAR® GX2-RX1000B

Forward Path Receiver

The Omnistar GX2 forward path receiver is designed for headend and hub applications using 1310 or 1550 nm wavelengths. Gain and slope controls are provided to easily accommodate varying link budgets as well as headend splitting and cabling needs. The GX2-RX1000B provides a high-density solution for high bandwidth downstream optical transport. Enhanced with PowerPC® technology by Motorola, these receivers introduce a new found intelligence into traditional headend equipment. The hot-swappable modules with unique embedded features, like Quick- Swap Module Configuration, maximize in-service time by eliminating the need for manual configuration.

The adjustable features and high RF gain of these receivers, coupled with the full complement of other OmniStar GX2 application modules, provide extreme flexibility for network design and fiber link optimization.

- High Module Density–Up to 16 receiver modules in a four rack-unit housing
- High Performance–An integrated low-noise preamp and high-performance post amp allows a high RF output level and exceptional distortion performance
- Intelligence–Contains high-performance PowerPC® microprocessor provided by Motorola
- Quick-Swap Capability–Replacement modules are recognized and updated with settings prestored by the Control Module
- Flexibility–An input range from -9 to +3 dBm and variable gain and slope controls accommodate various system architectures
- Plug-n-Play–Application modules with blind-mate RF connectors in the rear
- Energy Efficient–Designed with advanced integrated circuits for low power consumption

**Ordering Information**

| Model Number | Description |
|---|---|
| GX2-RX1000B | Forward path receiver module, SC/APC optical connector |
| GX2-RX1000B/E | Forward path receiver module, E2000 optical connector |

*FC/APC also available*

MOTOROLA

## Broadband Services Router

Motorola's Broadband Services Router 1000 (BSR 1000) is a compact, high-performance Cable Modem Termination System (CMTS) and full-featured router that enables broadband service providers to cost-effectively deliver voice, data, and multimedia content and services.

The BSR 1000 is a 1U, rack-mountable platform with an integrated up converter, and it is a perfect solution for small or medium-sized distribution hubs or for larger sites in the earlier stages of broadband service market penetration. Broadband providers can also deploy space-saving BSR 1000s in hospitality locations or Multiple Dwelling Unit (MDU) facilities to extend broadband access services.

The compact BSR 1000 can be deployed as a stand-alone unit or in small clusters to cost-effectively extend broadband access infrastructure to additional subscribers. This easy-to-use platform helps carriers develop a competitive edge in defining, deploying, and managing broadband services. The BSR 1000 implements SmartFlow™ features to cost-effectively extend the rich Quality of Service (QoS) support required to deliver multiple services. It can be installed by non-technical personnel and can operate as a Layer 2 bridge or as an edge router with enhanced security features.

Traffic flows from multiple BSR 1000s can be aggregated by the carrier-class Broadband Services Router 64000 (BSR 64000) to bring robust traffic management to a distributed environment. The BSR 1000 changes the value proposition for small broadband access network locations by offering a highly compact CMTS solution that can be installed in minutes to enable the cost-effective delivery of voice, data, and multimedia content and services.

- Compact, space-saving 1U platform that can be installed in minutes by non-technical personnel
- Fully compatible with the carrier-class BSR 64000
- Based on open systems standards, the BSR 1000 is Data Over Cable Service Interface Specification (DOCSIS) and EuroDOCSIS 1.1 qualified and PacketCable 1.0 qualified
- Managed via SNMP v1 and v3, standard DOCSIS and IETF MIBs, and a Command Line Interface
- Advanced Spectrum Management to ensure reliable and high-quality service delivery
- Supports 16,000 service flows to enable individual voice, data, and multimedia streams to be handled effectively
- SmartFlow QoS classification for thousands of flows at wire-speed

**Ordering Information**

- BSR-1000

## HCG-12 & HCG-24 Passive Combiners

The HCG-12 (12 Inputs) and HCG-24 (24 Inputs) are passive head-end combiners, intended to combine many modulator and processor outputs into one while maintaining the highest isolation between ports. Both the HCG-12 and the HCG-24 can be used on systems requiring performance to 1 GHz.

- Directional Coupler Design
- Front Panel Test Port
- Low Insertion Loss
- High Port-to-Port Isolation

**Ordering Information**
- HCG-12
- HCG-24

| | |
|---|---|
| Frequency Range | 5–1000 MHz |
| Insertion Loss | |
| HCG-12 | -16 dB (±1.5 dB) |
| HCG-24 | -22 dB (±2 dB) |
| Port-to-Port Isolation | 40 dB (typical) |
| Return Loss | 16 dB (typical) |
| Test Port | -20 dB |
| Dimensions 1 | 9"W x 1.75"H 3"D |

## AHC-16, AHC-16-860 Active Combiners

The AHC-16 series are 16 input amplified head-end combiner similar to the HC series. The inclusion of a high quality CATV hybrid amplifier provides positive gain at the highest output levels available.

- CATV Hybrid Amplification
- High Output
- High Isolation
- Low Distortion
- AC Convenience Outlet

**Ordering Information**
- 54-550 MHz ..... AHC-16
- 54-860 MHz ..... AHC-16-860

| | |
|---|---|
| Frequency Range: | 54-550 MHz (AHC-16)<br>54-860 MHz (AHC-16-860) |
| Port-to-Port Isolation: | 40 dB |
| Gain: | 0-15dB (adjustable) |
| Return Loss: | 16 dB |
| Maximum Output Level: | 58 dBmV (16 Ch ) |
| Power Requirements: | 117 VAC, 60 Hz, 12W |
| Operating Temperature: | 0–50º Celsius |
| Dimensions: | 19"W x 1.75"H 3"D |
| Weight: | 4 lbs |

Holland Electronics LLC

# Combiners

## RF Worx® SignalOn™ Series

ADC's RF Worx® SignalOn™ Series has been designed with these demanding service requirements in mind. This next generation RF signal management platform provides unmatched density, RF performance, and reliability – all at a competitive price. And with its patented "make-before-break" attenuator circuit design, maintaining your RF signal network has never been easier. The RF Worx® SignalOn™ Series, combined with the innovative cable management of the newly-designed chassis, provides engineers with a variety of products to simplify the headend signal management challenge.

- Industry's highest density
- Industry's best performance and specifications
- Patented make-before-break attenuator pad design for hitless signal balancing
- Chassis supports both passive and active modules
- Clear chassis door provides protection and clear view of modules
- Clear attenuator pad covers and patented pad guides for simplified maintenance
- High quality, precision F or BNC connectors
- Designed to exceed NEBS requirements for grounding/bonding
- Independent EMI near and far-field testing
- Ten year warranty on all passive modules

**Ordering Information**

**Splitters/Combiners** N – M **1 2 33 44**

**1** – **P** (Plain splitter/combiner)
**C** (Combiner with pad/monitor)
**S** (Splitter with pad/monitor)
**X** (Splitter & combiner with pad/monitor 2 x 4:1 module only)

**2** – **F** (F)
**B** (BNC)

**33** – **12** (2:1)
**14** (4:1)
**18** (8:1)
**32** (3 x 2:1*)
**14** (2 x 4:1*)

**44** – **MO** (0 dB default)
**M6** (6 dB default)

**Directional Couplers** N – MD **1 2 33 4**

**1** – **F** (F)
**B** (2 BNC)

**2** – **1** (Single circuit)
**2** (Triple circuit)

**33** – **12** (12 dB)
**20** (20 dB)

**4** – **F** (Front Monitor Port)
**R** (Rear narrowcast signal port)

**Chassis** N – C **111 2 3**

**1** – **20V** (20 position, Vertical)
**02H** (2 position, Horizontal)

**2** – **N** (No)
**Y** (Yes)

**3** – **B** (Black)
**C** (Blue)
**P** (Putty White)

**Cable Management Kits** *(includes rack mount cable management rings)*
- 2 brackets, 2 - 2.5" x 5.5" cable rings ..... N-ACMK-01P
- 4 brackets, 12 - 2.5" x 5.5" cable rings ..... N-ACMK-04P

**Chassis Extender Brackets**
- 20-position chassis, 23" rack ..... EB-87P
- 2-position chassis, 23" rack ..... EB-17P
- 20-position chassis, ETSI 21" rack ..... EB-100
- 2-position chassis, ETSI 21" rack ..... Contact TVC

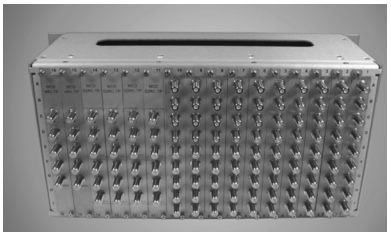
**Insertion/Withdrawal Tool**
- BNC connector ..... BT2000
- F connector ..... SC-F or SC-FG

**Terminating Plugs**
- BNC High Performance Terminating Plug, 75 Ohm ± 0.1% ..... BNC-TP2
- F High Performance Terminating Plug, 75 Ohm ± 0.1% ..... CF-TP2

**Attenuator Pads**
- XX dB pads, qty 25 (replace XX with 00 through 26) ..... N-ACC-AP-XX
- 1-5 dB pads, qty 5 each pad value, qty 25 total ..... N-ACC-AP-S1
- 6-10 dB pads, qty 5 each pad value, qty 25 total ..... N-ACC-AP-S2
- 11-15 dB pads, qty 5 each pad value, qty 25 total ..... N-ACC-AP-S3
- 16-20 dB pads, qty 5 each pad value, qty 25 total ..... N-ACC-AP-S4
- 21-25 dB pads, qty 5 each pad value, qty 25 total ..... N-ACC-AP-S5
- 3,6,9,12,15 dB pads, qty 5 each pad value, qty 25 total* ..... N-ACC-AP-MO
- 0,3,9,12,15 dB pads, qty 5 each pad value, qty 25 total** ..... N-ACC-AP-M6
- 75 Ohm termination pads, qty 25 ..... N-ACC-TP-75

**Module Conversion Kits**
- Kit to install 1 RF Worx passive module into SignalOn chassis ..... N-ACC-BRKT-RFW
- Kit to install 1 SignalOn passive module into MAXNET™ chassis1 ..... N-AMCK-01
- Kit to install 18 SignalOn passive modules into MAXNET™ chassis1 ..... N-AMCK-18

## MCD-5000 Series RF Signal Management



Electroline's network combining gear provides users with a standard cable management platform, combining multiple input signals to one port. RF signals from a variety of sources including audio/video modulators, channel processors and advanced services such as telephony, digital communications, network managers and status monitors can be routed through the combiners in a reliable and convenient modular format.

This space saving, compact modular design provides maximum density for easier installations, maintenance, and cable management. A standard 8-input to 1-output configuration can provide as many as 128 input ports in a 5 rack unit, 16 module vertical installation, or a total of 144 ports for combining and splitting.

As with the entire product line, the MCD Series has always been designed with you, the customer in mind. Our uniquely configured products provide a feature set that is required in today's expanding services market. Our MCD series of modular passives are engineered to be either forward or return path specific. The forward path modules (50-870 MHz) are manufactured with a built-in equalizer and -20 dB test point to outperform any competitor's product. Our ultra high performance modules exhibit the highest isolation response available in the market today. With multiple services and an increasing amount of traffic, networks will require this high degree of isolation to insure that signals do not "bleed" across any of the adjacent or common ports.

Electroline offers the ultimate in ultra high performance RF signal management. The MCD- 5000 Series incorporates ultra-flat response characteristics, unmatched port-to-port isolation, and a variety of space saving rack mounting options for complete modular flexibility and cable routing solutions. These passives are utilized in RF network configurations and routing in headend, hub, and node facilities.

- *Space saving modular design for maximum density and easier growth management*
- *An unmatched industry specification of 40 dB port-to-port isolation*
- *Modular chassis available in a variety of configurations*
- *Modular passives designed to be forward or return path specific for optimum performance*

**Ordering Information**

*Chassis Configurations:*

- MCD-5001 ..... 5 RU Chassis, 16 slots for any combination of MCD-4000/5000 Series Modules
- MCD-5001-16 ..... 5 RU Chassis, 16 slots for any MCD-5000 Series Modules, with 16 Front Panel Mounted Test Points
- MCD-5001-32 ..... 5 RU Chassis, 16 slots for any MCD-5000 Series Modules, with 32 Front Panel Mounted Test Points

*Forward Path Modules:*

- MCD-DFDC-XX ..... Dual Forward Directional Coupler Module, (xx) specify dB value, 50-870 MHz
- MCD-D2FC-TP ..... Dual 2-Way Forward Combiner Module, with -20 dB Test Point, 50-870 MHz
- MCD-D2FS-TP ..... Dual 2-Way Forward Splitter Module, with -20 dB Test Point, 50-870 MHz
- MCD-TFDC-XX ..... Triple Forward Directional Coupler Module, (xx) specify dB value, 50-870 MHz
- MCD-T2FC-TP ..... Triple 2-Way Forward Combiner Module, with -20 dB Test Point, 50-870 MHz
- MCD-T2FS-TP ..... Triple 2-Way Forward Splitter Module, with -20 dB Test Point, 50-870 MHz
- MCD-4FC-TP ..... 4-Way Forward Combiner Module, with -20 dB Test Point, 50-870 MHz
- MCD-4FS-TP ..... 4-Way Forward Splitter Module, with -20 dB Test Point, 50-870 MHz
- MCD-8FC-TP ..... 8-Way Forward Combiner Module, with -20 dB Test Point, 50-870 MHz
- MCD-8FS-TP ..... 8-Way Forward Splitter Module, with -20 dB Test Point, 50-870 MHz

*Return Path Modules:*

- MCD-D2RC-TP ..... Dual 2-Way Return Combiner Module, with -20 dB Test Point, 5-70 MHz
- MCD-D2RS-TP ..... Dual 2-Way Return Splitter Module, with -20 dB Test Point, 5-70 MHz
- MCD-T2RC-TP ..... Triple 2-Way Return Combiner Module, with -20 dB Test Point, 5-70 MHz
- MCD-T2RS-TP ..... Triple 2-Way Return Splitter Module, with -20 dB Test Point, 5-70 MHz
- MCD-4RC-TP ..... 4-Way Return Combiner Module, with -20 dB Test Point, 5-70 MHz
- MCD-4RS-TP ..... 4-Way Return Splitter Module, with -20 dB Test Point, 5-70 MHz
- MCD-8RC-TP ..... 8-Way Return Combiner Module, with -20 dB Test Point, 5-70 MHz
- MCD-8RS-TP ..... 8-Way Return Splitter Module, with -20 dB Test Point, 5-70 MHz

*Electroline also offers integrated active RF signal Management solutions.*
*Please call your TVC representative for more information on the FCD and RCD series of products*

# Demodulators

## Frequency Agile Demodulator

The Model HDM-1, frequency agile demodulator, has been designed to receive and demodulate all UHF, VHF, and CATV channels to baseband audio, video and multiplex signals. The HDM-1 uses a microprocessor driven PLL synthesized tuning circuit to assure precise tuning and accuracy. The microprocessor controls all functions and provides for easy channel selection using front panel channel up/down buttons and a large LED display.

- Low Distortion Demodulation
- Agile Input: UHF, VHF, CATV
- SAW Filtered
- Adjustable Audio & Video Outputs
- Microprocessor Controlled PLL Tuning
- Front Panel LED Channel Display
- 4.5 MHz Multiplex Output
- BTSC Stereo Output

| | |
|---|---|
| Input Channels | VHF: 2-13 (54-216 MHz)<br>UHF: 14-69 (470-810 MHz)<br>CATV: 2-99 (54-650 MHz)STD,HRC |
| Input Range: | –5 to +30 dBmV |
| Video Output: | .5–2V p-p, 75 ohms |
| Audio Ouput: | .2 – 2V p-p, 600 ohms |

**Ordering Information**

- HDM-1

**Holland**
*Electronics LLC*

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## Commander 6® NTSC Frequency Agile Demodulator

The Commander 6® Broadcast Demodulator (C6BD-II) is a precision, high performance demodulator used in Headend Signal Processing and Monitoring applications. Standard features include synchronous detection, two video outputs, aural subcarrrier output, stereo, and SAP outputs. A non-volatile memory can store and recall twenty different preset configurations.

The selected input channel frequency is displayed on the two line, twenty character LCD display. Local operator control is performed with the user-friendly keypad interface. Using the five push-button cursor keys , the user can select the input frequency in 0.25 MHz steps. The LCD is illuminated and uses “supertwist” technology for wide angle viewing. The C6BD-II is rack mountable when installed in the chassis model C6BDCH, a 2RU chassis that holds two C6BD-II units side by side. The C6BDCH has built-in ventilation allowing for stacking any headend unit directly on top or underneath without spacing, resulting in maximum space efficiency. The C6BDCH is required for rack mounting the C6BD-II.

- Space efficient
- RF or IF input
- Frequency agile tuning in 0.25 MHz steps
- Two video outputs
- Composite IF output
- Stereo and SAP audio outputs
- 4.5 MHz audio subcarrier output

**Ordering Information**

- C6BD-II ..... Frequency Agile Demodulator
- C6BDCH ..... 2 RU Chassis, holds two C6BD-II units

MOTOROLA

## Trilithic EAS // Encoder/Decoder and System Controller

- 3 U rack-mountable unit
- 16-key front panel keypad
- Front panel speaker/microphone
- Built-in character generator
- Internal telephone interface for local over-rides
- EAS message queuing technology
- Built-in System Controller eliminates the need for an external Computer/Controller
- Contact closures for external device activation and digital cable boxes
- 4 x 40 LCD display
- 6 audio inputs
- Supports up to 256 I.F. switches
- Supports up to 245 external character generators
- Fully supports remote Hub Sites

The central focus of the new Trilithic PHASE // product offering is the EAS // Encoder/Decoder and System Controller. Trilithic's design engineering capabilities have fully integrated the functions of an Encoder/Decoder, Character Generator, Telephone Interface, and System Controller into one single, compact, cost-effective, rack-mountable and easy to install 3U chassis.

The EAS // provides all of the features and functionality of the larger, more complex Emergency Alert System while minimizing the demands on capital expenditures and precious headend rack space. The EAS // fully supports EAS messaging through I.F., baseband, and composite substitution, character generator crawls for any or all channels, comb generators, multiple remote hubs, Motorola/GI digital channels, and any combination of these technologies, and is easily upgradeable for DVS-168 compliant network communications to support digital system EAS messaging.

All of the EAS messaging capabilities you've come to expect from Trilithic are now packaged in a single compact and inexpensive product that is the heartbeat of the most competitive and full-featured EAS product line available in the industry today.

The EAS // touts an exclusive front-panel set-up featuring a 16-button keypad. The front-panel also accommodates a 4 x 40 LCD display and a combination speaker/microphone.

The EAS // has built-in Local Telephone Access and over-ride, which will assist you in meeting and exceeding your present Franchise requirements.

## I.F. Distribution Amplifier & Switch Control

The power and simplicity of Trilithic's patent-pending system is further accentuated by the LS-16P, an I.F. distribution amplifier and switch controller. This unit accepts an I.F. signal from the EAS*y* System and produces 16 identical signals at its outputs. These supply signal for, and control, the SW-1's on modulators and processors. The signal level at each output is independently adjustable. This feature, available only in Trilithic products, permits you to precisely match substitution signal levels to each channel's existing I.F. level. This approach preserves your headend alignment so that launch levels remain constant, preserving the quality and integrity of your system during EAS messages.

**Ordering Information:**

- Amp/Switch Controller ..... LS-16P

## SW-1

I.F. substitution is one of the most cost-effective, yet simple solutions for EAS messaging. The SW-1 facilitates substituting an EAS signal at the modulator or processor's I.F. loop. This patent-pending, failsafe switch measures approximately 1" square, making it the smallest, yet most reliable and inexpensive I.F. switch available.

**Ordering Information**

- EAS Front End ..... 2010909000
- Phase II, System 1 ..... 2010909001
- Phase II, System 2 ..... 2010909000
- Phase II, System 3 ..... 2010909003

## Messenger *II*

Crawl messaging is the least obtrusive method of placing EAS or promotional messages on the viewers screen. Our character generators can create a single line crawl message on any or all channels. Trilithic offers two unique, cost-effective concepts in character generator messaging.

The Messenger *II* is a 1U or 1.75" high rack-mount unit containing six independent character generators. The products may be intermixed seamlessly within any system and they may be added at any time. You can start with a character generator on every channel, or use them on Premium/Pay channels only. They will operate in conjunction with any of Trilithic's EAS products and can even be located at remote hubs. All Trilithic's character generators include independent gen-lock as a standard feature.

The Messenger *II* is a cost effective rack-mounted unit that only occupies 1U of rack space in your headend. This unit contains a built-in power supply with (6) six quality gen-locked character generators. Each of these CG's provide a non-intrusive high resolution crawl with stereo audio switching. You can select white, black or grey characters over the program video or place the characters over a small black or grey banner. Again, the choice is yours!

**Ordering Information**

- Messenger II

TRILITHIC

---

## Audio/Video Comb Generator

- Emergency Audio and Video access to 70 television channels.
- Answers the cable TV interface problem.
- Compatible with all headends.
- An easy way to meet the FCC EAS mandate and local franchise requirements.
- Loop through video.
- High isolation trunk switch.
- Audio automatic gain control.
- Standard 19" by 5-1/4" rack mounting.
- Full one-year warranty.
- Affordable.

**Ordering Information**

- EAS AV-70

## 3272 & 3271 Series Channel Deletion Filters

This series of deletion filters attenuates the entire channel spectrum from video carrier to aural carrier to allow reinsertion of new information without interference.

The 55 dB (typical) continuous suppression from video carrier to aural carrier has been found to be more than ample for reinsertion.* Attenuation drops sharply at channel edges to preserve upper and lower adjacent channels. The operating temperature for model 3271Sub-160-166 is from 0° C to 50° C. The operating temperature for model W3272/R3272 is from 5° C to 35° C.

*Note: The 3272 Series offers an extended passband to 750 MHz.*
*With input signal levels lower than +12 dBm

**Ordering Information**

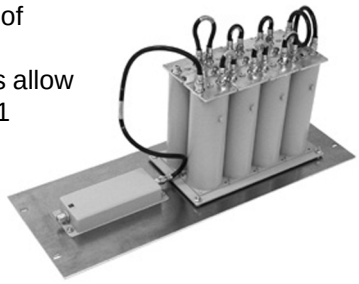
- Rack Mount ..... 3272
- Wall Mount ..... 3271

Rack Mount

Wall Mount

## Lowpass and Highpass Filters

The 6211LP/HP are a series of lowpass and highpass filters that are factory assembled networks, consisting of channel deletion filters and custom designed lowpass and highpass filters. The combination results in a “brickwall” filter eliminating blocks of channels while preserving adjacent channels of interest. The primary applications include deleting blocks of channels for re-insertion purposes, while maintaining the integrity of close adjacent channels. These networks allow for maximum use of existing cable spectrum. The operating temperature for the 6211 series is from 13° C to 33° C.



**Ordering Information**

- 6211LP/HP
  *When ordering, must specify channel (or frequency cutoffs)*

***Microwave Filter Company***

## DTV Decoder

The DVM-150E is a 1RU, Professional DTV Receiver/Decoder with the capability of handling SD & HD MPEG-2 4:2:0 DTV signals. Its modular design minimizes cost to the end user and allows it to be used in a wide variety of DTV applications. Seven module slots are available for end users to customize and choose the inputs and outputs that they desire, thus eliminating the extra cost & space of unwanted or unused inputs & outputs. The basic DVM-150E consists of a 1RU chassis equipped with a fan, power supply and motherboard.

Applications

- 8-VSB to NTSC/ANALOG Audio Conversion
- HD/SD Digital Video Decoding and Monitoring
- Options: SDI, HD-SDI, QAM, QPSK, YPbPr, RGB, SMPTE-310M, DVB-ASI, Closed Caption, Embedded Audio, Simultaneous SAP

**Ordering Information**

- DVM-150E (see options below)

| Position & Signal | Option * | Description |
|---|---|---|
| #1 TUNER | | |
| | A | (1) 8-VSB/QAM IN |
| | B | (1) QPSK IN |
| | R | RS232 Remote Control |
| | N | NONE |
| #2 MPEG2 | | |
| | A | (1) SMPTE IN, (1) SMPTE OUT, (1) DVB-ASI IN, (2) DVB-ASI OUT |
| | N | NONE |
| #3 VIDEO | | |
| | A | (1) S-VIDEO OUT, (1) NTSC OUT |
| | R | RS232 Remote Control |
| | N | NONE |
| #4 AUDIO | | |
| | A | (2) XLR (balanced) – Primary Audio |
| | B | (4) BNC (unbalanced) – without SAP |
| | C | (4) BNC (unbalanced) – with SAP |
| | D | Terminal Strip (balanced) – without SAP |
| | E | Terminal Strip (balanced) – with SAP |
| | F | Digital AC-3, (1) XLR |
| | N | NONE |
| #5 VIDEO | | |
| | A | (1) SDI OUT – embedded audio without SAP |
| | B | (1) SDI OUT – embedded audio with SAP |
| | R | RS232 Remote Control |
| | N | NONE |
| #6 VIDEO | | |
| | A | RGBHV/ Y Pb Pr (5 BNC's) |
| | N | NONE |
| #7 VIDEO | | |
| | A | (1) HDSDI OUT – embedded audio |
| | R | RS232 Remote Control |
| | N | NONE |

KTech TELECOM

## Dual 8VSB Demodulator

The DDR-150E is an 1RU, dual 8VSB demodulator with 2 independent ASI outputs, one for each RF input. This cost effective and space saving unit allows users to have two separate 8-VSB receivers in one box. The DDR-150E also allows the user to modify the PSIP VCT's Station ID, Major and Minor Channel Numbers.

Features

- Demodulates 2 independent 8-VSB input signals
- Generate 2 independent DVB-ASI output signals
- User can modify the PSIP VCT for each independent 8-VSB input
- VCT Modification Includes:
  - Major Channel #
  - Minor Channel #
  - Station ID
  - Transport Stream ID
- Control via RS232, RJ-45 or Front Panel Interface
- Loss of Transport Stream Alarm
- 1U 19" Rack Mountable

**Ordering Information**

- DDR-150E

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## Transport Stream PSIP Multiplexer

The MUX-150E takes in 2 ASI Transport Streams and generates 1 ASI output TS signal. With the PSIP option, the unit performs merging of the PSIP. With the QAM modulation option, the unit performs 64/256QAM with a frequency agile RF up-converter.

Features

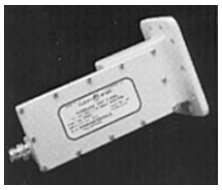
- Inputs: 2 DVB-ASI
- Outputs: 1 DVB-ASI
- Option: PSIP - merges PSIP from 8VSB Off-Air Signal
- Option: QAM - generates 64/256 QAM
- 1U 19" Rack Mountable

**Ordering Information**

- MUX-150E

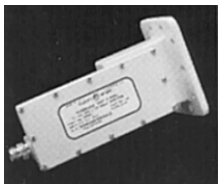
# LNB's

### Extended Digi-Ready®
### C-Band Phase Locked Loop (PLL) LNB



| | |
|---|---|
| Part Number: | 140194 |
| Input Frequency: | 3.4 to 4.2 GHz |
| Output Frequency: | 950 to 1750 MHz |
| Noise Temp Options: | 20°, 25° |
| Gain: | 63 dB Typical |
| Local Oscillator Stability: | ± 12 KHz Max |

### Extended Digi-Ready®
### C-Band Phase Locked Loop (PLL) LNB



| | |
|---|---|
| Part Number: | 140194-1 |
| Input Frequency: | 3.4 to 4.2 GHz |
| Output Frequency: | 950 to 1750 MHz |
| Noise Temp Options: | 20°, 25° |
| Gain: | 63 dB Typical |
| Local Oscillator Stability: | ± 125 KHz Max |

### Professional II C-Band LNB

| | |
|---|---|
| Part Number: | 140105-1 |
| Input Frequency: | 3.4 to 4.2 GHz |
| Output Frequency: | 950 to 1750 MHz |
| Noise Temp Options: | 17° |
| Gain: | 65 dB Typical |
| Local Oscillator Stability: | ± 500 KHz Max |

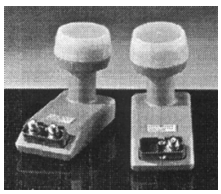
### Ku-Band Phase Locked Loop LNB

| | |
|---|---|
| Part Number: | 150338 |
| Input Frequency: | 11.7 to 12.2 GHz |
| Output Frequency: | 950 to 1450 MHz |
| Noise Figure: | 0.8 dB Typical |
| Local Oscillator Stability: | ± 25 KHz Max |

### Ku-Band Phase Locked Loop LNB

| | |
|---|---|
| Part Number: | 150338-1 |
| Input Frequency: | 11.7 to 12.2 GHz |
| Output Frequency: | 950 to 1450 MHz |
| Noise Figure: | 0.8 dB Typical |
| Local Oscillator Stability: | ± 210 KHz Max |

### DBS Single and Dual Ku-Band LNBFs



| | |
|---|---|
| Part Number: | 150517 Dual Output Option |
| Input Frequency: | 12.2 to 12.7 GHz |
| Output Frequency: | 950 to 1450 MHz |
| Noise Figure: | 1.1 dB Max. |

California Amplifier

## Frequency Agile Modulators

The HMA-500 and the HMA-860 series are high quality SAW filtered, frequency agile modulators specifically designed to meet the highest CATV performance standards. All channels are easily selected by front panel switches and verified by an easy-to-read LED channel display. The modulators feature an extremely low out of band noise level allowing their use in larger channel head-ends. The user-friendly front panel controls make the HMA-500 and the HMA-860 series modulators the ideal choice for any system where performance, reliability, and affordability are required.

- 50 or 60 dBmV Output Models
- Low Out-Of-Band Noise
- SAW Filtered
- Easy-to-Read LED Channel Display
- Overmodulation Indicators
- Crystal Referenced PLL Tuning
- Switching Power Supply *(Operates from 90–260VAC)*
- BTSC Stereo Compatible *(Built-in Encoder Available)*
- I.F. Loop

**Ordering Information** • HMA-500 • HMA-500H • HMA-860 • HMA-860H

Holland Electronics LLC

## VM2551 Agile Commercial Video Modulator

The R.L. Drake Company now offers you superior performance and extensive channel capacity with the VM2551 agile video modulator. Another quality product from Drake, the VM2551 is a vestigial sideband, agile modulator with synthesized visual and aural carriers and a full +55 dBmV output level. Designed to accept composite NTSC video and audio inputs from a satellite receiver, video server, off-air demodulator, DVD player, VCR, or similar source, the VM2551 features front panel video and audio over-modulation indicators and level controls to permit easy setup of modulation levels.

The use of frequency synthesis provides complete frequency agility in the range of 54 to 550 MHz using off-air or CATV (STD, IRC, or HRC) channel plans. In compliance with FCC regulations, channels that fall in specified aeronautical bands feature automatic frequency offset. The use of a superior SAW filter in the IF circuitry allows adjacent channel operation when used with other modulators or signal sources. A composite IF loop following the SAW filter and before signal conversion to the final RF output channel allows the insertion of scrambling equipment or an IF switch to provide switchover for EAS operation.

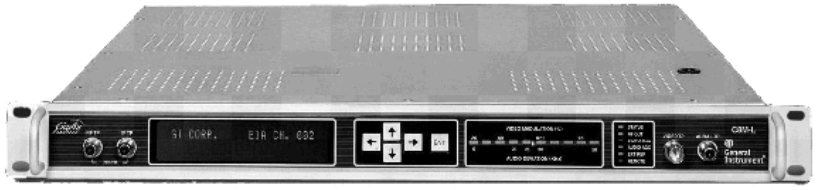
If required, the audio preemphasis may be defeated to allow use with a baseband stereo encoder or the normal internally generated aural carrier can be disabled and an externally sourced 4.5 MHz signal can be applied to the rear panel input. These features, combined with a carefully designed low distortion output stage, provide reliable and economical performance in an adjacent channel +55 dBmV cable television or private cable environment.

- A popular priced agile NTSC modulator.
- Frequency agility with 82 channel coverage from 54 MHz to 550 MHz.
- CATV (STD, HRC or IRC) or off-air channel plans selectable from front panel.
- Front panel control of channel selection, video level, audio level, output level, and A/V ratio.
- High output power to +55 dBmV.
- Designed for multiple modulator installations.
- Emergency Alert System (EAS) ready with IF composite loop.
- Composite IF loop to accommodate a variety of encryption systems.
- Audio and Video LED overmodulation indicators.
- Automatic channel offsets where specified by FCC regulations.
- SAW filtering to ensure quality performance.
- External source 4.5 MHz aural input.
- Defeatable pre-emphasis for use with baseband stereo encoders.
- Front panel monitor connection at -30dB

**Ordering Information**:.....VM2551

DRAKE®

## Analog Signal Processing Commander 8 Modulator NTSC



- Superior carrier-to-noise performance
- 1 GHz bandwidth in two models
- Frequency selection in 12.5 kHz steps
- Video/audio AGC standard feature
- Integrated DSP based BTSC stereo/SAP encoder option
- Video loop for baseband scrambling compatibility
- Network management ready
- DC power capable
- Downloadable firmware

The Commander$^{TM}$ 8 Modulator (model C8M) is the next generation headend television modulator that delivers superior performance in all areas with an unprecedented feature and option set. Two frequency agile models, the C8M-L (50 to 600 MHz) and the C8M-H (550 to 1000 MHz), cover all current and future broadband frequency requirements up to 1 GHz, with a convenient 50 MHz frequency overlap between models. Superior individual CNR performance of the C8M guarantees combined Commander 8 CNR of 65 dB for 149 channels.

The C8M uses a bright, two-line vacuum fluorescent display (VFD) that provides access to all modulator controls and is accessed via a convenient menu system. Front panel RF, IF, aural subcarrier and video test points are provided. Easy rear panel fuse access is also available.

The C8M provides as a standard feature two video/audio inputs and two IF inputs for redundancy, emergency alert or programming purposes, providing operational flexibility. The input sources may be switched automatically or manually. Provisions for adjusting peak-to-average audio level in four steps is provided with the audio AGC. The video DC clamp can be referenced to sync level, burst level or both, and an adjustable video white level clip function is also provided. Video AGC is also a standard feature.

The C8M is network management ready, and is compatible with the NETsentry Network Management Systems via the LIFEnet proxy as well as with the Headend Control Software (HCS).

The C8M is compatible with many commercial scrambling systems, offering a composite IF input connection to facilitate interfacing with model MVP-II in all scrambling modes, and dual IF loop-through connections for other encryption systems. The C8M also interfaces easily with the model CMTS BTSC stereo encoder; DSR-4500 DigiCipher® satellite receiver; C6BD television broadcast demodulator; and OAPL-* VHF off-air phaselock generator.

The C8M also supports IF to RF upconversion of digital signals including 64 QAM, 256 QAM, 8-VSB and QPSK signals.

**Ordering Information**

| Part Number | Description |
|---|---|
| C8M-L-XX | NTSC Modulator, 50-600MHz |
| C8M-L-XD | NTSC Modulator, 50-600MHz, DC pwr |
| C8M-L-SX | NTSC Modulator, 50-600MHz, Stereo (No SAP) |
| C8M-L-SD | NTSC Modulator, 50-600MHz, Stereo (No SAP) DC pwr |
| C8M-L-BX | NTSC Modulator, 50-600MHz, Stereo & SAP |
| C8M-L-BD | NTSC Modulator, 50-600MHz, Stereo & SAP, DC pwr |
| C8M-H-XX | NTSC Modulator, 550-600MHz |
| C8M-H-XD | NTSC Modulator, 550-600MHz, DC pwr |
| C8M-H-SX | NTSC Modulator, 550-600MHz, Stereo (No SAP) |
| C8M-H-SD | NTSC Modulator, 550-600MHz, Stereo (No SAP) DC pwr |
| C8M-H-BX | NTSC Modulator, 550-600MHz, Stereo & SAP |
| C8M-H-BD | NTSC Modulator, 550-600MHz, Stereo & SAP, DC pwr |

MOTOROLA

## Frequency Agile Processors

The HP-40 and HP-60 frequency agile processors have been designed to convert any off-air or cable channel input to any cable channel 2–78. All channel conversions are performed using simple front panel buttons and a large LED display indicating input and output channels. Frequency control is accomplished by a microprocessor controlled, PLL synthesized tuning circuit to assure accurate, stable operation. The HP-40 and HP-60 both use SAW filtered conversions to assure high out-of-band rejection, as well as a high reliability CATV hybrid output amplifier (HP-60) for low distortion and high output performance.

- 50 & 60 dBmV Output Models
- Precise Signal Regulation
- Easy-to-Read Front Panel LED Channel Display
- BTSC Stereo Compatible
- Switching Power Supply *(Operates From 90 to 260VAC)*
- Dual SAW Filtering
- Adjacent Channel Performance

**Ordering Information**

- HP-40
- HP-60
- HP-40-860
- HP-60-860

Holland
Electronics LLC

## Heterodyne Channel Processor

- Low cost NTSC channel processor.
- Synthesized input tuning of Off-Air TV channels 2 - 69, standard CATV channels 2 - 125, and IRC, HRC channels 1 - 125, set by a front panel push wheel switch
- Synthesized RF output on CATV channels 2 - 78 and 95 - 99, set by a front panel pushwheel switch
- Selectable plus or minus output frequency offsets with front panel pushwheel switch
- Dual Saw filter IF allows adjacent channel operation in a crowded CATV environment
- IF loop-thru connections for scrambling encoders or IF stereo processors
- High output power adjustable to +60 dBmV

The R. L. Drake HCP1550 is a high quality, frequency agile channel processor capable of converting any VHF, UHF, or CATV input signal to any standard output channel between 54 and 550 MHz. Input and output frequency, including output frequency offset, are easily set with front panel push wheel switches. A/V ratio and output level controls are also provided along with IF loop-thru connections to offer exceptional flexibility.

**Ordering Information**

- Heterdyne Channel Processor ..... HCP1550

DRAKE®

## Bud Industries
## Large Cabinet Racks: The Economizer

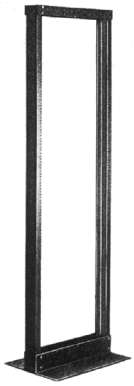
- Welded Frame: 14-gauge steel vertical rails. 16-gauge steel top and bottom. Uniquely designed, 16-gauge steel rail supports. Furnished complete with removable sides, rear door and one pair of panel mounting rails
- Panel Mounting Rails: 12-gauge steel. Fully adjustable, tapped #10-32 in front on E.I.A. universal spacing. (Use #7346 screws - order separately) Separate .28 diameter holes provided for mounting accessories
- Side Panel: 20-gauge steel. Removable from outside for easy access
- Bottom: Pierced for RC-7758 casters, and with one 9.56 square hole and four 1.11 knock outs for cable access
- 1200lb Equipment load capacity
- Finishes: Sand Texture (S), Royal Blue Texture (RB), and Black Texture (BT) are standard. Available in other Bud textured finishes at no extra cost

**Ordering Information:** *Ventilated Economical Racks with 19" panel width*

| Part Number | Panel Space | Clear Inside Depth |
|---|---|---|
| ER-16602 | 42.00" | 17.00" |
| ER-16605 | 70.00" | 17.00" |
| ER-16606 | 78.75" | 17.00" |
| ER-16612 | 42.00" | 24.00" |
| ER-16615 | 70.00" | 24.00" |
| ER-16616 | 78.75" | 24.00" |

Also available - Economizer Racks with 24" panel width

### Open Racks Heavy Duty Steel Racks



These heavy duty racks, an extension of the Bud RR-1265 Series, are available in 6', 7' and 9' heights and 19" and 23" wide panel spaces. Panel mounting holes are #12-24 UNC tapped on E.I.A. universal spacing. Panel mounting holes
are located on front flanges only.

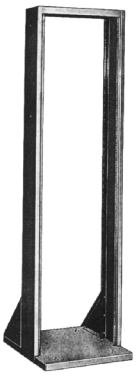
- Base Angles: 1/4" x 3 1/2" x 4 7/8"
- Top Angels: 1/8" x 2 3/32" x 1 9/16"
- Uprights: 3/16" x 3" x 1 9/32"
- Overall Width: 20 3/8" for 19" rack; 24 3/8" for 23" rack
- Overall Depth: 12 3/4" base, 3" upright, 6 1/8" top
- Finish: Black Texture (BT)

Racks are shipped knocked down in two (2) cartons, with all necessary assembly and mounting hardware included.

**Ordering Information**

| Catalog No. | Panel Space | Ht | Wt |
|---|---|---|---|
| RR-1265 | 66 1/2" x 19" | 72 1/4" | 64 lbs. |
| RR-1269 | 77" x 19" | 82 3/4" | 73 lbs. |
| RR-1270 | 101 1/2" x 19" | 107 1/4" | 85 lbs. |
| RR-1290 | 66 1/2" x 23" | 72 1/4" | 72 lbs. |
| RR-1291 | 77" x 23" | 82 3/4" | 79 lbs. |
| RR-1292 | 101 1/2" x 23" | 107 1/4" | 91 lbs. |

### RR-1367 Series



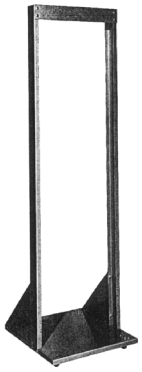
- Design Features: Extra-sturdy racks made of 14 & 12 gauge steel. Eight-inch deep welded “U” member and triangular bracket hold uprights to base (12ga). Panel mounting rails tapped #10-32 on E.I.A. universal spacing. Chassis type base, 20 7/8" x 26", drilled for RC-7758 casters. Racks may be bolted together in Add-A-Rack fashion.
- Finish: Metallic Gray (MG) and Black Texture (BT).

Racks are shipped knocked down in two (2) cartons, with all necessary assembly and mounting hardware included.

**Ordering Information**

| Catalog No. | Panel Space | Ht. | Width | Wt. |
|---|---|---|---|---|
| RR-1367 | 61 1/4" x 19" | 64 5/8" | 20 7/8" | 74 lbs. |
| RR-1368 | 70" x 19" | 73 3/8" | 20 7/8" | 77 lbs. |
| RR-1369 | 77" x 19" | 80 3/8" | 20 7/8" | 81 lbs. |

### RR-1263 Series



- Design Features: Exceptionally strong structure made up of chassis-type base and supporting angles. Uprights, 7/64" steel channels, 3" deep; top plate, 1 1/8" x 3 1/8". Rails tapped #10-32 on E.I.A. universal spacing. Base is 19 31/32" x 22" and drilled for RC-7758 casters
- Finish: Metallic Gray (MG) and Black Texture (BT)

Racks are shipped knocked down in two (2) cartons, with all necessary assembly and mounting hardware included.

**Ordering Information**

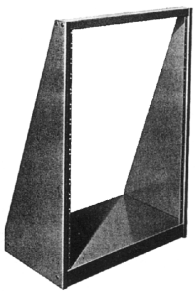
| Catalog No. | Panel Space | Ht. | Wt. |
|---|---|---|---|
| RR-1263 | 31 1/2" x 19" | 35 5/8" | 36 lbs. |
| RR-1363 | 36 3/4" x 19" | 40 7/8" | 37 lbs. |
| RR-1264 | 66 1/2" x 19" | 70 5/8" | 46 lbs. |
| RR-1364 | 71 3/4" x 19" | 75 5/8" | 47 lbs. |
| RR-1366 | 77" x 19" | 81 1/8" | 49 lbs. |

### Table Top Rack

- Design Features: Chassis-type base holds heavy components for table mounting applications Supporting angles provide strength, rigidity. Panel mounting rails taped #10-32 on E.I.A. universal spacing. Standard 19" panel fits flush with front Base, 20 3/8" x 12". Shipped knocked down
- Finish: Metallic Gray (MG) and Black Texture (BT)

**Ordering Information**

| Catalog No. | Panel Space | Ht. | Wt. |
|---|---|---|---|
| RR-1248 | 21" | 24" | 14 1/4 lbs. |
| RR-1249 | 28" | 31" | 16 3/4 lbs. |



## Digicipher ® I I Satellite Multiplex Decrypter

- Delivers 256 and 64 QAM satellite multiplexes
- Concurrent decryption of up to 24 services, each service may include video, multiple audio channels and data
- DHEI and ASI output. Selectable 38.8 (default) or 26.97 Mbps transport outputs
- MCPC and SCPC operation
- Dual L-Band input ports
- Stackable 1RU chassis
- Analog video with full time diagnostics for local monitoring
- Analog audio for local diagnostics

The DSR-4400MD from Motorola is a powerful digital head-end product, capable of simultaneous decryption of up to 24 services. Whether your application is to feed a 256 QAM channel or a 64 QAM channel, the DSR-4400MD is the answer. With the DSR-4400MD, you can output a full MPEG-II multiplex at an information rate of 38.8 Mbps or 26.97 Mbps, depending on your needs.

The DSR-4400MD comes equipped with industry standard interfaces that enable seamless connection to DigiCipher II IRT-1000, IRT-2000, MPS Remultiplexer and other head-end equipment for cable encryption and cable modulation.

The full range of DigiCipher II symbol and code rates is supported, including the higher combined symbol rate of 29.27 Msps, rate 3/4 to enable 40.46 Mbps information rate transmission. With the lower SCPC rates, the DSR-4400MD becomes a flexible product that supports partial transponder utilization. Packaged in a 1RU chassis, the DSR-4400MD offers local monitoring of a single service and the ability to step through the authorization and encryption state for each service. In the event of a transport stream fault, or loss of authorization for any of the provided services, the DSR-4400MD will trigger an alarm indication for the user.

**Ordering Information**

- Digicipher ® I I Satellite Multiplex Decrypter ..... DSR-4400MD

MOTOROLA

# Professional Satellite Receiver

An advanced digital satellite receiver for analog service conversion and basic cable operations.

The new DSR-4402X IRD from Motorola brings the latest technology advances from the recognized leader in satellite program delivery. Building on the DigiCipher® II platform, the DSR-4402X IRD is affordable and easy to use. Start with the new packaging design that fits in a standard 19" relay rack and requires only a single rack unit of space. The DSR-4402X is designed to deliver outstanding video and audio performance in either DigiCipher II or DVB modes. This receiver can output either NTSC or PAL video formats, automatically matching the programmer's video format.

With a variable front-end and bypass capabilities, the DSR-4402X is ideally suited for network conversion from analog to digital. Full VBI reinsertion on lines 10 - 22 for SID/AMOL I & II and NABTS is standard on the DSR-4402X. Now equipped with DVBASI, the DSR-4402X is ready to connect to the rest of your head-end equipment.

- MPEG-2 Main Level@Main Profile
- DigiCipher II and DVB modes of operation
- DigiCipher II *MegaPipe* Support
- Variable tuning from 4 MHz to 36 MHz
- Dolby® Digital and MPEG layer II audio Processing
- VBI reinsertion SID/AMOL-II, NABTS and closed caption
- Stackable 1RU chassis design
- DigiCipher® II conditional access control
- Quick disconnect screw terminals for easy installation
- Bypass video and audio inputs
- DTMF cue tones for local ad insertion
- ASI output for easy connection to digital cable headend products

**Ordering Information**

- Professional Satellite Receiver ..... DSR-4402X

MOTOROLA

# Digicipher ® I I Professional Satellite Receiver

- 8 RF Inputs
- 10/100 BaseT Ethernet Port
- ASI and DHEI Outputs
- MPEG-2 Main Level@Main Profile and DigiCipher II Digital Video
- Variable Symbol Rate from 3.25 Msps to 29.27 Msps
- Dolby® AC-3® Audio Processing
- VBI Reinsertion SID/AMOL-I & II, NABTS and Closed Caption
- 4-Line Front Panel
- Single Button OSD
- DigiCipher II Conditional Access Control
- Quick Disconnect Screw Terminals For Easy Installation of Audio and Data
- Bypass Video and Audio Inputs
- DTMF Cue Tones for Local Ad Insertion
- 3 Sets of Contact Closures (1 set can be used for summary alarm)
-

The DSR-4500X is Motorola's advanced commercial integrated receiver/decoder (IRD) which features a wide array of outputs to meet the expanding needs of cable programmers and cable operators. In addition to the standard audio and video ports, the DSR-4500X has connections to deliver data services, MPEG-2 transport streams and headend signaling.

For a variety of data delivery applications, the DSR-4500X includes an asynchronous (RS-232) port, an isochronous (RS-422) port, and an Ethernet (10/100 Base T) port. To help deliver complete MPEG-2 transport streams, DHEI and DVB-ASI outputs are provided. For signaling existing headend equipment, a DSR-4500X DTMF tone generator interoperates with ad insertion systems, while 3 sets of contact closures are provided for general purpose device control. Full VBI reinsertion on lines 10 - 22 for SID/AMOL I & II and NABTS is also standard on the DSR-4500X.

Supplementing the DSR-4500X's extensive feature set is a newly designed front panel interface that helps allow for quick set-up and installation. A single button push brings up the on screen diagnostics (OSD) - presented on a dedicated video output – to enable rapid access to pertinent information. Disaster recovery and network migration are effectively implemented by utilizing multiple RF input ports, a variable front-end tuner, the bypass mode of operation and the ability to receive clear analog programming in addition to digital signals.

The full range of DigiCipher II symbol and code rates are supported, including the higher combined rate of 29.27 Msps, rate 3/4, combined to enable 40.46 Mbps information rate transmission.

**Ordering Information**

- Digicipher ® I I Professional Satellite Receiver ..... DSR-4500X

# QQQT
## Quad QPSK/QAM Transcoder

- Quad Array of Four (4) High Performance QPSK to QAM Transcoders
- Four Agile Input Tuners Select Appropriate Digital Transponders
- Four Agile Output Converters Select the Appropriate Output Channel
- Enhanced Output Frequency Range (54-750 MHz)
- DigiCipher® II Compatible (Use with HITS, WSNet & Cancom™ Services)
- External IF Loop for Purposes Such as EAS
- Built-in Computer Software Control Capability
- Rack Mount - 1.75” Spacing, Rugged Aluminum Chassis
- Three Year Product Warranty
- C-UL Listed

The Blonder Tongue QQQT (Quad QPSK/QAM Transcoder) is designed to offer cable television operators the ability to offer a state-of-the-art digital television package to consumers at an extremely cost effective price. The Triple QT saves precious system bandwidth by transcoding existing 30 MHz QPSK satellite transponder signals to 6 MHz QAM signals in preparation for distribution on a terrestrial cable television system.

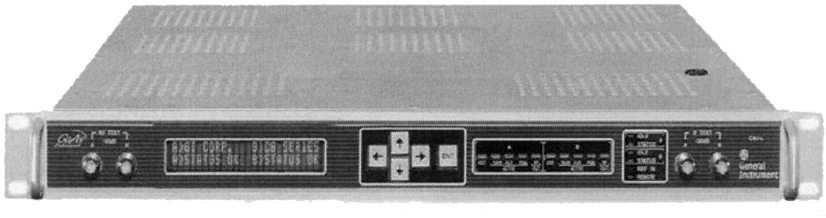
Each QQQT unit contains four (4) separate QPSK to QAM transcoder sections that independently process a 30 MHz digital QPSK satellite transponder stream. Each section is fully agile to allow the reception of any DigiCipher® II based QPSK transponder signal (ITU-T J.83 Annex B). The QPSK signal is then transcoded by the Triple QT to a 6 MHz QAM IF signal. The resultant 6 MHz wide QAM IF signal is then translated to any CATV RF channel assignment in the 54-750 MHz frequency range (CATV 2-117). This includes FM Band channels 95-99 (A1-A5). The four (4) channel combined unit output is +40 dBmV.

The unit processing is transparent to the conditional access method, the compression method and the individual subscriber programming selections and works in conjunction with QAM set-top decoders located in the subscribers home. This makes the Triple QT the ideal means of delivery for either a selected portion, or a complete digital satellite service. It is both a bandwidth efficient and cost effective way to distribute superior quality digital programming to multiple subscribers.

**Ordering Information**

- Quad QPSK/QAM Transcoder ..... 6289A

## Analog Signal Processing
## Commander 8® Dual Upconverter



MOTOROLA

- Superior phase noise performance
- Dual independent upconverters in 1RU
- 1 GHz bandwidth in two models
- Frequency selection in 12.5 kHz steps or by HRC, IRC, EIA channel maps
- User friendly display and interface
- Network management ready
- Internal sensors for IF and RF signals
- DC power capable
- Downloadable firmware

The Commander 8® Upconverter (model C8U) is the next generation of headend upconverter which builds on the award winning success of the Commander 6® Upconverter. The C8U leads the upconverter industry in performance and features and is an ideal solution for both analog and digital headend and hub locations. Two frequency agile models, the C8U-L (50 to 600 MHz) and the C8U-H (550 to 1000 MHz), cover all current and future broadband frequency requirements up to 1 GHz, with a convenient 50 MHz frequency overlap between models.

The C8U consists of dual independent upconverters in a reliable single rack unit (1RU) package, avoiding thermal and mating problems while providing space efficiency. A bright, wide two-line vacuum fluorescent display (VFD) provides access to all upconverter controls and is accessed via a convenient menu system. Front panel access to independent RF and IF test points is provided. Easy rear panel fuse access is also provided.

Each independent upconverter in the C8U incorporates three switchable IF inputs for redundancy, emergency alert or programming purposes, facilitating operational flexibility. These IF sources may be switched automatically or manually.

The C8U is network management ready and is compatible with Motorola's NETsentry Network Management Systems via the LIFEnet proxy as well as with Motorola's Headend Control Software (HCS).

In a digital system, the C8U can accept any digital IF signal between 41.0 and 47.0 MHz. The C8U continues the C6U legacy of handling many types of digital signals including 64 QAM, 256 QAM, 8-VSB and QPSK signals.

In an analog system, the C8U supports addressable channels. An encoded composite IF signal is received from a scrambler, such as Motorola's model MVP-II, and is upconverted to the proper RF channel for transmission.

**Ordering Information**

- C8U-L-X ..... NTSC Dual Upconverter, 50-600 MHz
- C8U-L-D ..... NTSC Dual Upconverter, 50-600 MHz DC Power
- C8U-H-X ..... NTSC Dual Upconverter, 550-1000 MHz
- C8U-H-D ..... NTSC Dual Upconverter, 550-1000 MHz, DC Power
- C8U-LH-X ..... NTSC Dual Upconverter, 1 Low Channel & 1 High Channel
- C8U-LHDX ..... NTSC Dual Upconverter, 1 Low Channel & 1 High Channel, DC Power

## SmartPro Intelligent Line-Interactive UPS Systems

SmartPro Rackmount UPS Systems make the best use of available rack space by providing more battery backup (up to 5000VA) and premium product features in a compact case—as slim as 1U! Select models are compact and shallow enough to allow users to mount a UPS system and an external battery pack back-to-back to increase the power protection in the same rack space.

Whatever size computer system you manage, the SmartPro Rackmount family of UPS systems has the perfect power protection solution to safeguard your equipment investment and maintain your productivity. SmartPro Rackmount UPS Systems offer everything you need to protect computer systems in a single box, providing complete protection against all types of power problems (brownouts, blackouts, surges and line noise). Line-interactive operation—also known as automatic voltage regulation (AVR)— automatically regulates incoming voltage to keep equipment working through low voltage (brownouts) and high voltage conditions indefinitely, without draining battery power. SmartPro Rackmount UPS Systems provide reliable battery power to keep computers up safely through short blackouts and allow enough time to safely shut down during longer ones. In addition, all AC outlets are backed by internal surge suppression and line noise filtering components to protect equipment from damage due to lightning and surges or audio/video distortion due to line noise.

**Ordering Information**

| UPS | Systems | Bk-up Time Half/Full Load | Nominal Input-Output V/Freq 60Hz | AC Receptacles | |
|---|---|---|---|---|---|
| | | | | Qty | NEMA Type |
| SMART500RT1U | 500/300 | 14/4 | 120 | 6 | 5-15R |
| SMART750RM1U | 750/450 | 24/7 | 120 | 6 | 5-15R |
| SMART1000RM1U | 1000/640 | 25/10 | 120 | 6 | 5-15R |
| SMART1000RM2U | 1000/700 | 21/9 | 120 | 6 | 5-15R |
| SMART1500RM2U | 1500/1000 | 25/10 | 120 | 8 | 5-15R |
| SMART1500RMXL2Ua | 1500/1000 | 25/10+ | 120 | 8 | 5-15R |
| SMART2200RMXL2U | 2200/1600 | 20/8+ | 120 | 8 | 6 (5-15R)<br>2 (5-15/20R) |
| SMART2600RM2U | 2600/2100 | 14/6+ | 120 | 9 | 6 (5-15R)<br>2 (5-15/20R)<br>1 (L5-30R) |
| SMART3000RM2U | 3000/2250 | 13/4+ | 120 | 9 | 6 (5-15R)<br>2 (5-15/20R)<br>1 (L5-30R) |
| SMART5000RT3U (with 1 battery pack) | 5000/4000 | 38/16+ | 208 (in)<br>208 & 120 (out) | 14 | 10 (5-15R)<br>2 (5-15/20R)<br>1 (L6-30R)<br>1 (L14-30R) |
| SMART5000RT3UXR (with 2 battery pack) | 5000/4000 | 90/39+ | 208 (in)<br>208 & 120 (out) | 14 | 10 (5-15R)<br>2 (5-15/20R)<br>1 (L6-30R)<br>1 (L14-30R) |
| SMART5000TEL3U | 5000/3750 | 24/10 | 208 (in)<br>208 & 120 (out)<br>(400VA @120max out) | 5 | 2 (5-15R)<br>2 (L6-20R)<br>1 (L6-30R) |

SMART500RT1U, SMART1000RM1U & SMART1000RM1U

SMART1000RM2U, SMART1500RM2U, SMART1500RMXL2Ua, SMART2200RMXL2U, SMART2600RM2U & SMART3000RM2U

SMART5000RT2U, SMART5000RT3UXR & SMART5000TEL3U

| External Battery Pack | |
|---|---|
| BP36V15-2U | 36V External battery pack and cable, 2U rack space<br>(for SMART1500RMXL2Ua model only) Not expandable, Grey 2-point conn. |
| BP48V24-2U | 48V standard run external battery pack and cable, 2U rack space<br>(for SMART2200RMXL2U, SMART2600RM2U and SMART3000RM2U models).<br>Not expandable. Blue 2-point connector |
| BP48V60RT-3U | 48V extended run external battery pack and cable, 3U rack space<br>(for SMART2200RMXL2U, SMART2600RM2U, SMART3000RM2U,<br>SMART5000RT3U and SMART5000RT3UXR modles only).<br>Expandable. Blue 2-point connector |

**ES-25 Line Amplifier**

Frequency Range: ..... 900 to 1750 MHz
Gain: ..... 20 dB ±2 dB
Input Level: ..... -40 dBm to 65dBm
Noise Figure: ..... < 5 dB
DC Powered through output Conn.
Connectors: ..... 75 ohms Type “F” Female
Power: ..... + 15 to +24 VDC (75 mA)
Size: ..... L: 3.74 W: 1.96 H: .90"

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**ELA-20 Line Amplifier**

Frequency Range: ..... 900 to 2050 MHz
Gain: ..... 20 dB ±3dB
Input Level: ..... 45 to - 65dBm
DC Powered through output connectors
Connectors: ..... 75 ohms Type “F” Female
Power: ..... + 12 to +24 VDC (80 mA)
Size: ..... L: 2.87 W: 1.87 H: .68"

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**SED-772 2-Way Power Divider**

Frequency Range: ..... 5 to 2050 MHz
Insertion Loss: ..... 6.0 dB
Connectors: ..... 75 ohms Type “F” Female
DC Power Passing One Port
Size: ..... L: 2.04 W: 2.16 H:.90"

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**SED-773 3-Way Power Divider**

Frequency Range: ..... 5 to 2050 MHz
Insertion Loss: ..... 9.0 dB
Connectors: ..... 75 ohms Type “F” Female
DC Power Passing One Port
Size: ..... L: 2.04 W: 2.16 H: .90"

**SED-774 4-Way Power Divider**

Frequency Range: ..... 5 to 2050 MHz
Insertion Loss: ..... 10.0 dB
Connectors: ..... 75 ohms Type “F” Female
DC Power Passing One Port
Size: ..... L: 2.91 W: 2.16 H: .90"

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**SED-776 6-Way Power Divider**

Frequency Range: ..... 5 to 2050 MHz
Insertion Loss: ..... 15.0 dB
Connectors: ..... 75 ohms Type “F” Female
DC Power Passing One Port
Size: ..... L: 4.64 W: 2.16 H: .90"

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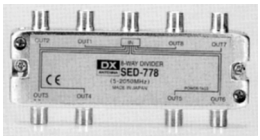
**SED-778 8-Way Power Divider**




Frequency Range: ..... 5 to 2050 MHz
Insertion Loss: ..... 17.0 dB
Connectors: ..... 75 ohms Type “F” Female
DC Power Passing One Port
Size: ..... L: 4.64 W: 2.16 H: .90"

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**DSW-3A V/H Select Switch**

Frequency Range: ..... 900 to 1450 MHz
Insertion Loss: ..... 3 dB max.
Isolation: ..... 52 dB min.
Switching Volt: ..... -15/+15 VDC (50 mA) Supplied by separate wire
DC Power Passing to Both Ports (24 VDC max.)
Connectors: ..... 75 ohms Type “F” Female
Size: ..... L: 3.72 W: 2.70 H: 1.50"

**PS-208 DC Power Supply**

Prime Power: ..... 120VAC, 60 Hz, 34W
Output Volt: ..... +20 ±0.5 VDC (800 mA max.)
Ripple: ..... <20mV p-p max.
Size: ..... L: 6.93 W: 5.28 H: 2.36"

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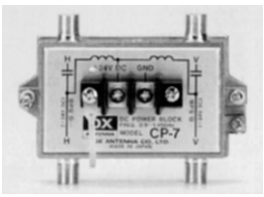
**CP-7 Dual Power Block**




Frequency Range: ..... 900 to 1450 MHz
Insertion Loss: ..... <0.5 dB
Accepts: ..... +24 VDC for LNB Power Supplied by separate wire
Connectors: ..... 75 ohmsType “F” Female
Size: ..... L: 3.70 W: 2.72 H: 1.36"

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**DAT-3 FLS 3dB Attenuator, DAT-6 FLS 6dB Attenuator, DAT-10 FLS 10dB Attenuator**

Frequency Range: ..... 10 kHz - 1895 MHz
Attenuation: ..... ±0.5dB
DC Power Pass: ..... 0 to + 24 VDC
Connectors: ..... 75 ohms Type “F” Female 75 ohms Type “F” Male
Size: ..... L: 2"

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**SEC-1071 One Port Directional Coupler**

Frequency Range: ..... 5 to 2050 MHz
Tap: ..... -10 dB
Insertion Loss: ..... £ 3.0 dB
Connectors: ..... 75 ohms Type “F” Female
Size: ..... L: 2.04 W: 2.16 H: .90"
Also available: SEC-1571 (-15dB Tap)
SEC-2071 (-20 dB Tap)

**SEC-1072 Two Port Directional Coupler**

Frequency Range: ..... 5 to 2050 MHz
Tap: ..... -10 dB
Insertion Loss: ..... £4.5 dB
Connectors: ..... 75 ohms Type “F” Female
Size: ..... L: 2.04 W: 2.16 H: .90"
Also available: SEC-1572 (-15dB Tap)
SEC-2072 (-20 dB Tap)

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**SEC-1074 Four Port Directional Coupler**

Frequency Range: ..... 5 to 2050 MHz
Tap: ..... -10 dB
Insertion Loss: ..... £ 6.5 dB
Connectors: ..... 75 ohms Type “F” Female
Size: ..... L: 2.91 W: 2.16 H: .90"
Also available: SEC-1574 (-15dB Tap)
SEC-2074 (-20 dB Tap)